

PURCHASE DESCRIPTION

SYNTHESIZED SIGNAL GENERATOR (10 kHz to 110 MHz)

FSNSC-A

- 1.0 GENERAL This procurement requires a programmable synthesized signal generator employing no more than two plug-ins and covering a frequency range of 10 kHz to 110 MHz.
- 2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800D, Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications with the following exceptions:
- a. The non-operating temperature requirement is limited to the range of -40°C to +70°C.
  - b. The relative humidity requirement is limited to 95% noncondensing.
  - c. The operating and non-operating altitude requirements are not invoked.
  - d. The EMI requirement is not invoked.
  - e. The warm-up time is extended to 72 hours.
- 3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.
- 3.1 Frequency Characteristics
- 3.1.1 Frequency Range: At least 10 kHz to 110 MHz
  - 3.1.2 Frequency Resolution: 1 Hz; digital readout
  - 3.1.3 Frequency Stability
    - 3.1.3.1 Internal: At least  $\pm 3 \times 10^{-9}$ /day
    - 3.1.3.2 External: Equal to external standard frequency stability
  - 3.1.4 Spectral Purity
    - 3.1.4.1 Harmonics/Sub-harmonics: At least -25 dBc
    - 3.1.4.2 Non-Harmonics/Spurious: At least -50 dBc
    - 3.1.4.3 Single Sideband Phase Noise: Less than -100 dBc/Hz at 10 kHz offset
  - 3.1.5 Reference Frequency
    - 3.1.5.1 Internal Reference Oscillator: 10 MHz
    - 3.1.5.2 External Reference Oscillator: 5 or 10 MHz, 0.5 to 2.0 Vrms into 170 ohms
- 3.2 Output Characteristics
- 3.2.1 Range: +10 to -140 dBm
  - 3.2.2 Accuracy:  $\pm 2.0$  dB over entire range
  - 3.2.3 Flatness:  $\pm 1.0$  dB
  - 3.2.4 Digital Sweep: Auto, single, or manual operation with selectable speeds 0.1, 1.0 or 50 seconds
- 3.3 Modulation Characteristics
- 3.3.1 Amplitude Modulation
    - 3.3.1.1 Internal

- 3.3.1.1.1 Rate: At least 400 Hz and 1 kHz  $\pm 5\%$
- 3.3.1.1.2 Depth: At least 0 to 90%
- 3.3.1.1.3 Accuracy:  $\pm 5\%$  of full scale
- 3.3.1.1.4 Distortion: Less than 5% at 50% depth and 1 kHz rate
- 3.3.1.2 External
- 3.3.1.2.1 Rate: At least 20 Hz to 50 kHz for carrier frequencies  $> 4$  MHz; 20 Hz to 5 kHz for carrier frequencies  $< 4$  MHz and  $> 0.4$  MHz; 0 Hz to 100 Hz for carrier frequencies  $< 0.4$  MHz
- 3.3.1.2.2 Depth: At least 0 to 90%
- 3.3.1.2.3 Accuracy:  $\pm 5\%$  of full scale
- 3.3.1.2.4 Distortion: Less than 5% at 50% depth and 1 kHz rate
- 3.3.1.2.5 Input Impedance: 600 ohms
- 3.3.2 Frequency Modulation
- 3.3.2.1 Internal
- 3.3.2.1.1 Rate: At least 400 Hz and 1 kHz  $\pm 5\%$
- 3.3.2.1.2 Deviation: At least 0 to 1 MHz
- 3.3.2.1.3 Accuracy:  $\pm 5\%$  of full scale
- 3.3.2.2 External
- 3.3.2.2.1 Rate: At least dc to 1 MHz
- 3.3.2.2.2 Deviation: At least 0 to 1 MHz
- 3.3.2.2.3 Distortion: Less than 3% for deviation  $< 1$  MHz, at rates  $< 20$  kHz
- 3.3.2.2.4 Input Impedance: 600 ohms

#### 4.0 GENERAL REQUIREMENTS

- 4.1 Power: 115/230 Vac  $\pm 10\%$ , 50/60 or 400 Hz  $\pm 10\%$ , 350 watts maximum
- 4.2 Dimensions: The total volume of the unit shall not exceed 46,342 cm<sup>3</sup> (2,828 in<sup>3</sup>) with a maximum height of 185 mm (7.25 in).
- 4.3 Weight: The total weight of the unit shall not exceed 30 kg (66 lbs).
- 4.4 Calibration Interval: After calibration, the equipment shall meet each performance requirement within the tolerance specified for a period of at least 12 months.
- 4.5 Remote Control: Instrument must be capable of operating via the IEEE-488 interface bus and shall provide the capability to talk and listen.